

Updated Eurobitume Technical Guidance on Maximum Safe Handling Temperatures for Bitumen (Paving and Industrial)

For many years, bitumen manufacturers have specified maximum safe handling & storage temperatures for bitumen products, primarily to prevent the formation of flammable atmospheres in heated storage tanks. The maximum handling & storage temperatures vary according to bitumen grade, but the current recommended maximums for bitumen & Air-Rectified bitumen are 200°C and for Severely Oxidised bitumen 230°C¹. Eurobitume has recommended these maximum handling & storage temperatures to its members since at least 1997 and they have been published in a number of documents.

Bitumen is generally handled hot and temperature is a key determinant for both the amount and composition of emissions. Research studies have shown that for temperatures within the range recommended by Eurobitume, worker exposures are likely to be within regulatory limits and are unlikely to be hazardous to health^{2, 3}. Some data on emissions generated in the laboratory at temperatures above the recommended maximum handling & storage temperatures, suggest that worker exposures are likely to be higher and that a health hazard cannot be precluded^{3, 4}.

Eurobitume has reviewed the data available currently and the situation can be summarised as follows:

- Sufficient data are available to evaluate the HSE hazards and risks of emissions from hot bitumen, for temperatures below the recommended maximum values for both paving and industrial grades i.e. 200°C and 230°C respectively or the maximum temperature specified, whichever is the lower.
- Based on current knowledge, there is some limited evidence to suggest that when certain types of bitumen (e.g. Built Up Roofing Asphalt Type III) are used above the maximum recommended temperatures, occupational exposure may present a hazard to health.
- In some applications, users employ working temperatures in excess of the recommended handling & storage maxima. Whilst it may be possible to operate safely at higher operating temperatures, such operations should be subject to specific task based assessment to identify HSE risks and any measures that need to be taken to reduce exposure. *Employers have a legal obligation to assess and control HSE risks in the workplace from exposure to chemicals and ensure compliance with workplace exposure limits⁵.*
- Eurobitume has no plans to commission additional health hazard studies, either below or above current recommended maximum temperatures.

¹ IP Bitumen Safety code, part 11, 4th edition,
<http://www.energyinst.org.uk/content/files/bitumentables.pdf>

² 24 months inhalation carcinogenicity study of bitumen fumes in Wistar (WU) rats. Fuhst, R.; Creutzenberg, O.; Ernst, H.; Hansen, T.; Pohlmann, G.; Preiss, A.; Rittinghausen, S. (2007): Int J Occup Environ Hyg 4 (Suppl. 1): 20-43

³ Asphalt fume dermal carcinogenicity potential: I. dermal carcinogenicity evaluation of asphalt (bitumen) fume condensates. Clark CR, Burnett DM, Parker CM, Arp EW, Swanson MS, Minsavage GD, Kriech AJ, Osborn LV, Freeman JJ, Barter RA, Newton PE, Beazley SL, Stewart CW. Regul Toxicol Pharmacol. 2011 Oct;61(1):9-16. Epub 2011 Apr 18.

⁴ Asphalt fume dermal carcinogenicity potential: II. Initiation-promotion assay of Type III built-up roofing Asphalt. Freeman JJ, Schreiner CA, Beazley S, Burnett DM, Clark CR, Mahagaokar S, Parker CM, Stewart CW, Swanson MS, Arp EW. Regul Toxicol Pharmacol. 2011 Oct;61(1):17-22. Epub 2011 May 27

⁵ COUNCIL DIRECTIVE 98/24/EC of 7 April 1998 on the protection of the health and safety of workers from the risks related to chemical agents at work